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TECHNICAL MEMORANDUM

EXPOSURE ASSESSMENT SCENARIOS

FOR THE

POWER BURST FACILITY AND AUXILIARY REACTOR AREA

IDAHO NATIONAL ENGINEERING LABORATORY

July 1992

Revision 0

1. INTRODUCTION

As agreed by the Idaho National Engineering Laboratory (INEL) Federal Facility Agreement and Consent Order (FFA/CO) Remedial Project Managers (RPMs), this Technical Memorandum was prepared to provide information on which reasonable future land use scenarios for Waste Area Group (WAG) 5 Operable Unit (OU) risk assessments can be based. WAG 5, as defined in the FFA/CO Action Plan, includes 13 OUs at the Auxiliary Reactor Area (ARA) and Power Burst Facility (PBF) of the INEL.

This memorandum provides use plans for land surrounding the INEL, soil survey information, and site planning information for the INEL that were evaluated to develop future use scenarios for the WAG 5 OUs.

2. LAND USE PLANS SURROUNDING INEL

The INEL is located in Bonneville, Jefferson, Butte, and Bingham Counties as shown on Figure 1. The following organizations were contacted regarding their land use plans for land surrounding the INEL Site:

- Bingham County Planning and Zoning
- Bonneville County Planning and Zoning
- Butte County Planning and Zoning
- Clark County Planning and Zoning
- Jefferson County Planning and Zoning
- Idaho Cattleman's Association
- Idaho Crop Improvement Association
- Idaho Department of Agriculture Soil Conservation Service
- Idaho Department of Lands
- Idaho Department of Fish and Game
- Idaho Historical Preservation Office
- University of Idaho Experimental Sheep Station

- U.S. Bureau of Land Management
- U.S. Department of Agriculture
- U.S. Fish and Wildlife Service
- U.S. Forest Service

This Technical Memorandum summarizes information gathered from these organizations; detailed information obtained can be found in Appendix A. Some recreational hunting activities are allowed up to one-half mile inside the INEL Site boundary. The only other nonindustrial use of the INEL Site is grazing. There is no irrigation or crop production. A portion of the INEL located within Bonneville County is classified by the Soil Conservation Service as agricultural, which means the land is suitable for grazing, farming, livestock, dairying, pasturage, cultivation, or animal husbandry. In Bonneville County, there is no residential or farm potential around the boundary and consequently there is no prospect of growth. In Jefferson County, the Federally-managed land is classified by the U.S. Bureau of Land Management and used as rangeland or barren land. The areas in Jefferson County adjacent to the east INEL Site boundary consist of agricultural cropland and rangeland (where livestock roam and feed). In Bingham County, the area south of the INEL Site is classified as natural where land and/or water is in a natural unimproved state. This classification may include mineral deposits, timber, rangeland, watersheds, recreation areas, and wildlife habitat. In Butte County, the area adjacent to the west INEL Site boundary is controlled by the U.S. Bureau of Land Management and is used for rangeland. Clark County, located north of the INEL Site, has no land use plans.

ARA Auxiliary Reactor Area
 ANL-W Argonne National Laboratory-West
 CFA Central Facilities Area
 EBR-I Experimental Breeder Reactor I
 EBR-II Experimental Breeder Reactor II
 ICPP Idaho Chemical Processing Plant
 IET Initial Engine Test
 LOFT Loss-of-Fluid Test (Facility)
 NRF Naval Reactor Facility
 PSF Power Burst Facility
 RWMC Radioactive Waste Management Complex
 STF Security Training Facility
 TAN Test Area North
 TRA Test Reactor Area
 TREAT Transient Reactor Test (Facility)
 TSF Technical Support Facility
 WMO Waste Management Office
 WRRTF Water Reactor Research Test Facility

July 1, 1992
 Revision 0

• National Historic Landmark

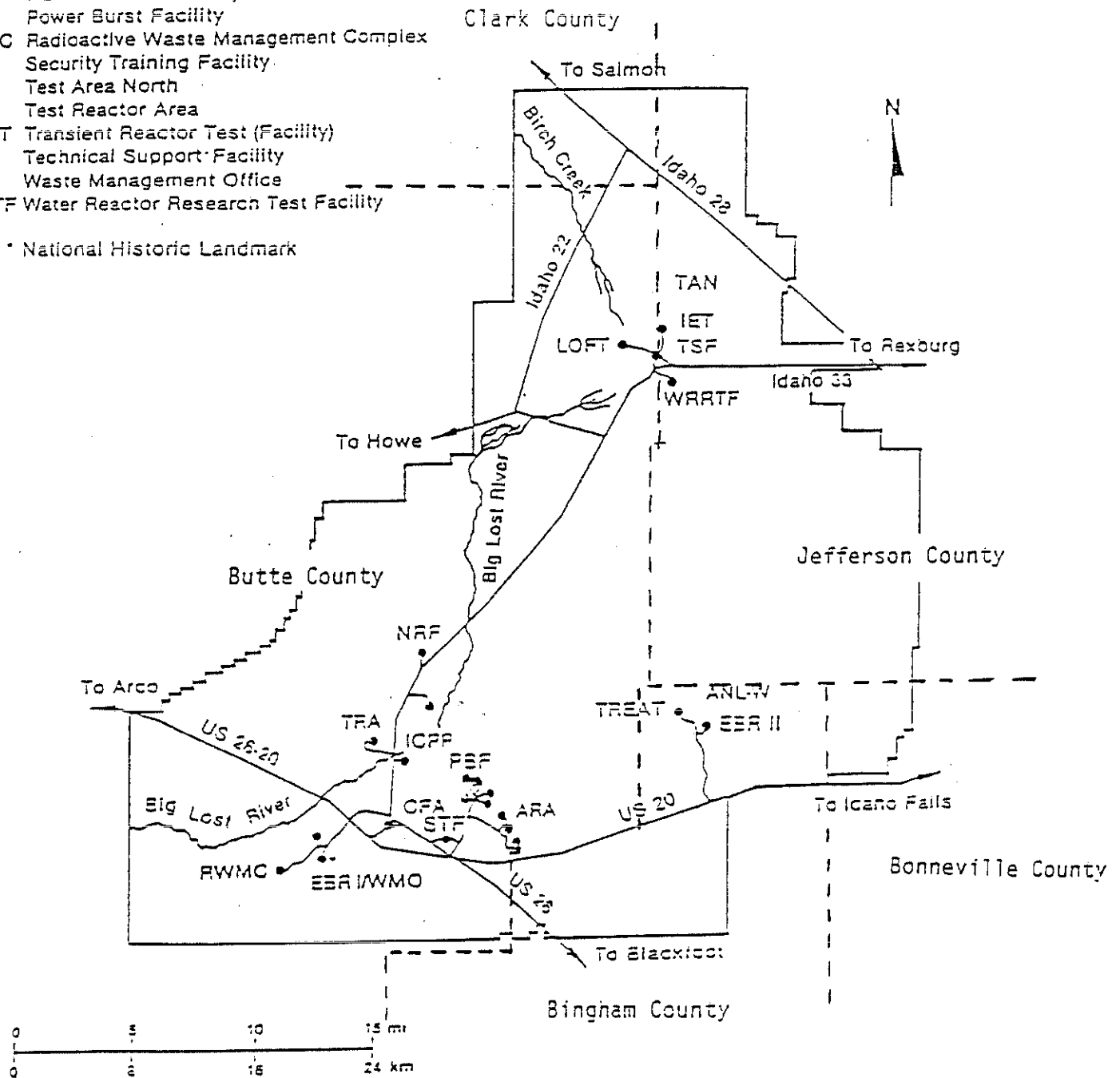


Figure 1. Map of the INEL Site

3. SOIL SURVEY INFORMATION

Soil surveys have been prepared for Bonneville, Jefferson, and Clark Counties. The Butte County soil survey is currently being prepared. In Bonneville County, the majority of the area is categorized as the Pancheri-Polatis soil unit according to general soil-use maps. This soil unit is suited for irrigated crops and urban development. However, urban development would be somewhat limited, and agriculture is significantly limited by rock outcrops. In Jefferson County, there are three general soil units. Two of these soil units are in the northern portion of the INEL Site and have agricultural potential if irrigated. The third unit is comprised of rock outcrops (lava beds) and could be used for range, wildlife habitat, and recreation. No potential urban uses were identified. In Clark County, there are two major soil units. The Allhands-Fallert soil unit is suitable for agriculture with moderate difficulty; the Whiteknob-Gravelly loam unit is suitable for agriculture with irrigation.

Soils in the vicinity of WAG 5 are shallow and poorly developed, as is typical of soils in the southern portion of the INEL. With the exception of playas to the southwest of PBF, the soils in the vicinity of the PBF facilities are composed of windblown (eolian) sediments exhibiting a sandy loam or loamy composition. The majority of the soils are Aridisols with calcic horizons (accumulation of calcium carbonates) appearing at various depths.

4. SITE PLANNING FOR ARA and PBF

The ARA facilities are not expected to experience further use. ARA has completed its useful life, been abandoned, and decontamination and decommissioning (D&D) activities are planned to begin in FY 1994 and end in 1999. PBF houses the only reactor remaining in WAG 5 and it was shut down in 1992 with the D&D schedule to be determined. PBF facilities also house the

Waste Experimental Reduction Facility (WERF) and the Mixed Waste Storage Facility (MWSF), which both have planned operations until the year 2000 and closure activities scheduled through 2005 at a minimum.

The U.S. Nuclear Regulatory Commission (NRC) has established regulations regarding land disposal of radioactive waste (see 10 CFR 61). The NRC regulations are intended to protect the general population from releases of radioactivity, and inadvertent intrusion, protect workers during facility operations, and ensure stability of the site after closure. To achieve the required protection levels, NRC requires access control to the site for up to 100 years.

5. SITE PLANNING FOR THE INEL

The future use of the INEL is being reviewed at this time. Possible future projects include the reconfiguration of the Nuclear Weapons Complex (NWC) and the siting of the New Production Reactor (NPR). The reconfiguration of the NWC could result in relocating some facilities to the INEL. The siting of these facilities would result in public use restrictions well into the next century. The final decision for the location of the NPR has not been made. Whether or not these facilities are sited at the INEL, long-range planning indicates that the INEL will continue to operate into the foreseeable future.

6. PRESENT AND FUTURE LAND USE

6.1 Present Land Use

The populations closest to ARA and PBF include ranchers and farmers who are located on land adjacent to the INEL Site boundary. The INEL is 890 square miles of Federally-owned land that has been withdrawn from public use. There are no resident populations at ARA or PBF. The nearest permanent residents live in Atomic City (approximately 35 residents) located 10 miles

south of ARA and PBF. Other population centers in the vicinity include Idaho Falls (approximately 43,000 residents located 40 miles east of ARA and PBF), Blackfoot (approximately 10,000 residents located 42 miles southeast of ARA and PBF), and Arco (approximately 1,000 residents located 30 miles to the west of ARA and PBF).

Fall hunting activities occur up to one-half mile inside the INEL Site boundary, but no closer than 9 miles from ARA and PBF. Livestock grazing is permitted in designated areas near the perimeter of the INEL Site. Herdsmen are likely to be present on the east and south grazing areas during the winter months and to the west during the rest of the year. Individuals involved in hunting and grazing activities do not have access to ARA or PBF.

6.2 Future Land Use

A potential reasonable future use scenario provides for current industrial land use, to be replaced with rural, residential-agriculture/livestock grazing use, with some full-time residents at or near the ARA and PBF sites. This scenario would be classified as residential-agriculture in risk assessment terms. The residential-agriculture scenario was selected because the current land use and land-use planning includes agriculture/livestock grazing at INEL's perimeter. This future land use scenario is possible because water would be available from the Snake River Plain Aquifer. This future use is typical of the existing agricultural economy in the vicinity of INEL and the residential-agricultural scenario is compatible with the present climate, geology, economy, and soils. A future urban-residential use is unlikely because INEL is an industrial site located in a rural area with a low population density and low projected growth. Future recreational use could consist of activities such as hunting, camping, hiking, and other outdoor activities.

7. TIME FRAME FOR SCENARIOS

Including WERF and MWSF operations and D&D, the ARA and PBF WAG has planned activities until at least 2005, and institutional controls are required at the INEL until 2105 at a minimum. Although ARA and PBF facilities are anticipated to have no further nuclear reactor operations, they are located near other facilities which are anticipated to have extended operational use (e.g., Argonne National Laboratory-West, the Test Reactor Area, and the Idaho Chemical Processing Plant), which will necessitate institutional controls at the INEL well into the future. The residential-agricultural scenario would be unlikely to replace the current industrial land use before 2105 because of the planned ARA and PBF activities and an additional 100 years of institutional controls. On the basis of land use planning in Section 2, agricultural activity would be limited to grazing in this area. Use of the WAG 5 area would be marginal for the use due to shallow soils, basalt outcrops, and the 500-600 ft depth to groundwater. Therefore, the most reasonable scenario at ARA and PBF in the near term is INEL industrial, followed by potential rural agricultural use in the future if INEL operations cease.

July 1, 1992
Revision 0

APPENDIX A
Land Use and Land Use Plans

NOTE

The information is based upon existing land-use authority and planning around the INEL Site. The INEL Site is located on Federal land that has been withdrawn from public use. Public access to the INEL Site is primarily limited to two Federal highways and three State highways. Other roads within the INEL are restricted to INEL personnel and visitors on official business and are patrolled by onsite security personnel. Public access will be restricted as long as the INEL Site is withdrawn from public domain.

Table A-1. USE FOR LAND PLANS SURROUNDING THE INEL

<u>Organization</u>	<u>Land Use Plans</u>
U.S. Forest Service (USFS)	The USFS does not have direct contact with the INEL Site (1 mile removed). There is no timber activity around the area. There is some trail erosion prevention 9 miles north of the Site. There is some hunting activity but little use.
Idaho Department of Fish and Game (F&G)	The only F&G involvement is with hunters who enter one-half mile within the INEL Site boundary.
Idaho Department of Lands (IDL)	IDL activities involve only cattle grazing. There will be no residential activity under IDL jurisdiction.
Idaho Crop Improvement Association	There are no crop improvement activities onsite.
U.S. Department of Agriculture (USDA)	There are no activities onsite.
U.S. Fish and Wildlife (USFW)	There are no fish and wildlife activities around the INEL. The closest area is about 20 miles.
Idaho Cattleman's Association	The only foreseeable use is grazing. There will be no building except for the moving of water troughs. Grazing of cattle on the INEL Site is limited to areas near the southwestern boundaries and is controlled by annual allotment.
University of Idaho Experimental Sheep Station	Ten acres are leased within the INEL Site. The Sheep Station does not have any land-use plans for the area. they use the area as a holding place from October to May.

Table A-1 (continued)

<u>Organization</u>	<u>Land Use Plans</u>
Idaho Historical Preservation Office (IHPO)	The IHPO reviews reports submitted by the INEL archaeologist.
U.S. Bureau of Land Management (BLM)	The BLM manages land outside the INEL Site boundary. These lands are managed for multiple use including grazing and recreation. The present management plan will be updated in approximately 3 years.
Idaho Department of Agriculture Soil Conservation Service (IDASCS)	All services in Bonneville, Jefferson, Butte, Clark, and Bingham Counties work to prevent erosion. The IDASCS works with ranchers and farmers to meet the provisions of the Food Security Act of 1985. Chemicals or pesticides may be used in areas where pests are abundant. The service also maintains range resources. Activities such as spraying depend upon request. West Bonneville County is a lava desert. The 1961 mineral survey deemed spraying economically unfeasible.

COUNTIES

Bonneville	No prospect of growth. No residential or farm potential around the INEL Site boundary. The Bonneville/INEL interface is considered agricultural, which means land is used for grazing, farming, livestock, dairying, pasturage, cultivation, or animal husbandry. Unused, wooded, floodable, or other marginal areas may be included. The land owned by the government is also classified as open space and contains limited timber, minerals, dry farming, and recreation.
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Table A-1 (continued)

<u>Organization</u>	<u>Land Use Plans</u>
Jefferson	Practically all of the Federally-controlled land (48.8 % of the County) is classified and used as rangeland or barren land. Areas bordering the east INEL Site boundary consist of agricultural cropland (land used for grazing, farming, livestock, dairying, pasturage, cultivation, or animal husbandry, unused, wooded, floodable, or other marginal areas) and rangeland (where animals roam and feed).
Bingham	The area south of the site is considered natural resource, land and/or water in a natural, unimproved state including that which may be growing on it or found in it. It may include, but is not limited to, mineral deposits, timber, rangeland, watersheds, recreation areas and wildlife habitat. Land further south of the INEL Site is classified as multiple use.
Butte	The west boundary of the INEL Site is controlled by the BLM and is used for rangeland. Beyond the border is also rangeland with agricultural activities near Howe.
Clark	Clark County has no land-use plans or map for the INEL vicinity.

SOURCES OF INFORMATION FOR LAND USE PLANS^a

Forest Service: Keith Tweedy (Dubois), 374-5422

Idaho Department of Fish and Game:

Justin Naderman (Idaho Falls), 525-7290

Idaho Department of Lands:

Mr. Benedict or Bob Brammer (Idaho Falls), 523-5398

Idaho Crop Improvement Association:

Dr. Clark (Idaho Falls), 522-9198

U.S. Department of Agriculture:

W. G. Nielson (Boise), 334-3521

Idaho Cattleman's Association:

(Boise), 343-1615; and
Bob Waddoups (Arco), 527-8242

University of Idaho Experimental Sheep Station:

Sharon Weller (Dubois), 374-5306

U.S. Bureau of Land Management:

LeRoy Cook (Idaho Falls), 524-7500

U.S. Fish and Wildlife:

Jack Richardson (Hamer), 662-5423

Idaho Historical Preservation Office:

Glenda King (Boise), 334-3847

^a The area code for all telephone numbers listed is (208).

Soil Conservation Service (Counties):

Bonneville:	Dennis Hadley, 522-5137
Jefferson:	Ken Beckman, 745-6662
	Mudlake: Ms. Lacasio, 663-4463
Butte:	Dan Holden, 527-8557
Clark:	Lloyd Bradshaw, 356-3218
Bingham:	785-6505

County Planning and Zoning:

Bonneville:	Alonzo Zaugg, 529-1386
Jefferson:	745-9222
Butte:	Judy Bailey, 527-3021
Clark:	Dan Lucas, 374-5304
Bingham:	Neil Morgan, 785-5005, ext. 278

^a The area code for all telephone numbers listed is (208).

Agricultural cropland: land used for grazing, farming, livestock dairying, pasturage, cultivation, or animal husbandry. Unused, wooded, floodable, or other marginal areas.

Rangeland: Where animals roam and feed.

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Revision 2

JEFFERSON COUNTY IDAHO LAND USE

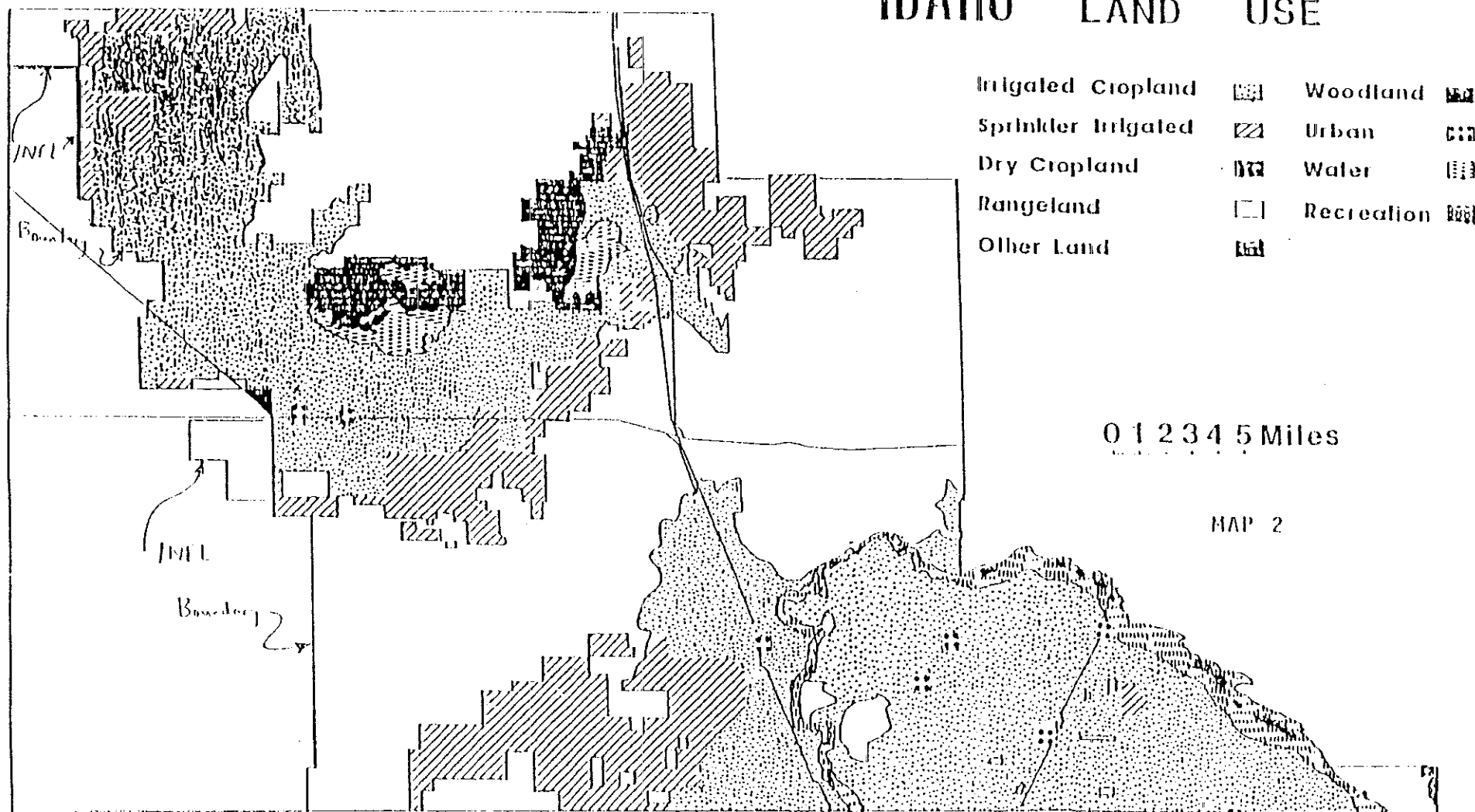


Figure A-1. Jefferson County Land Use.

Natural Resources: Land and/or water in a natural, unimproved state including that which may be growing on it or found in it; it may include, but are not limited to, mineral deposits, timber, rangeland, watersheds, recreation areas and wildlife habitat.

Multiple use: The multiple purpose for which land or a building is designated, arranged, intended or for which it is or may be occupied or maintained.

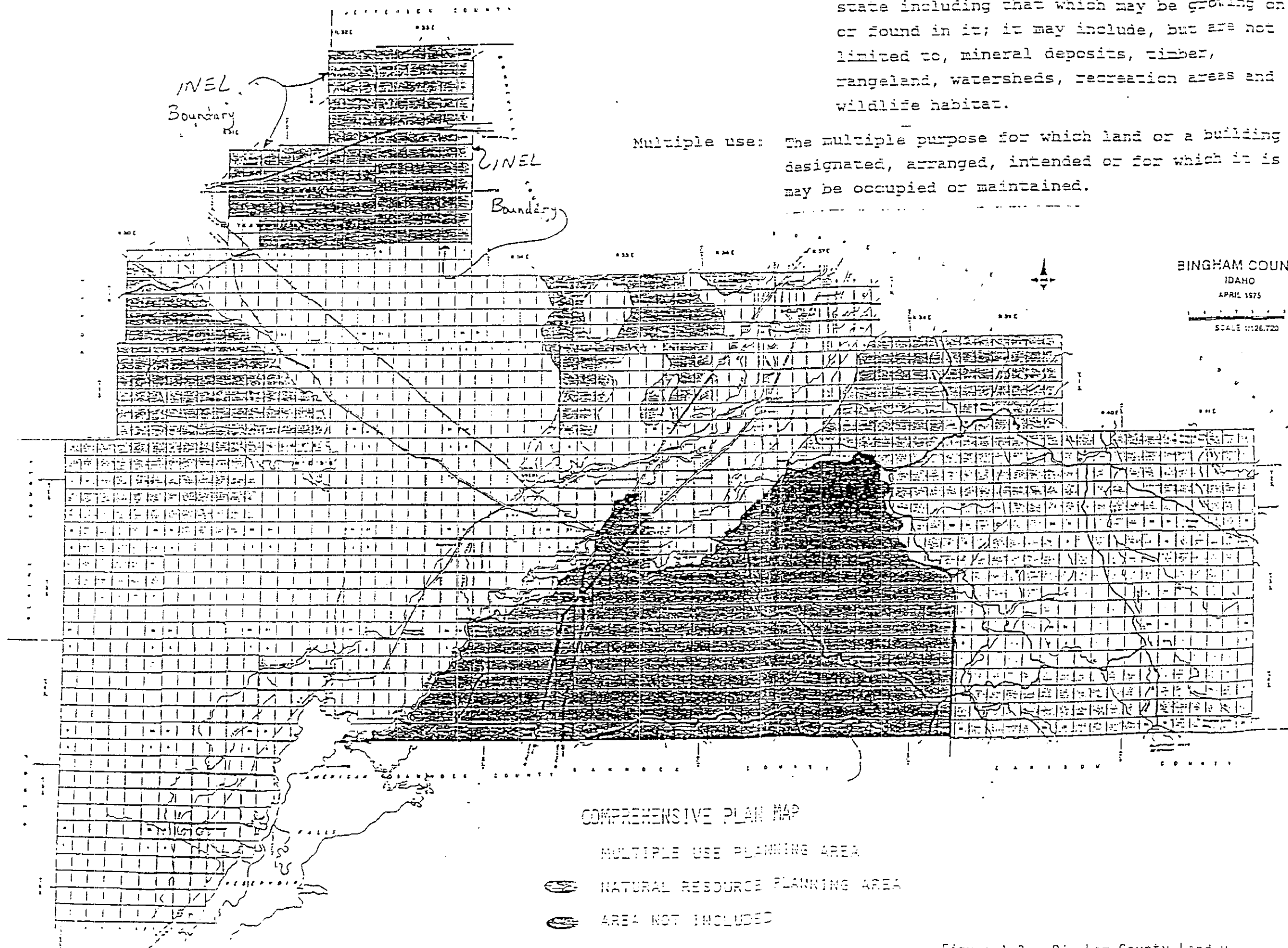


Figure A-3. Bingham County Land Use.

BUTTE COUNTY LAND USE

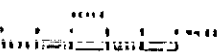
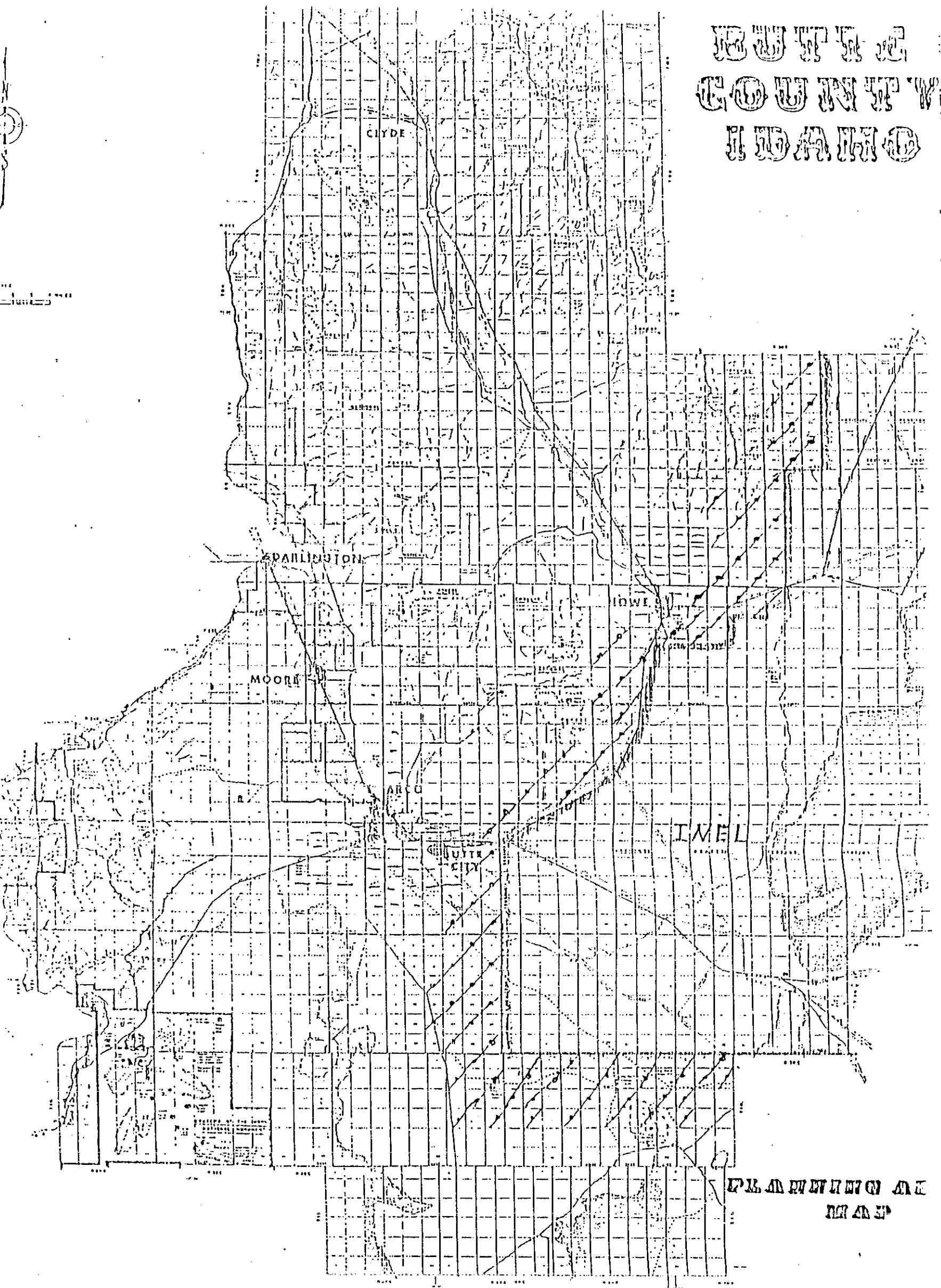


Figure A-4. Butte County Land Use.

A-11

July 1, 1992
Revision 0



Rangeland: Where animals roam and feed.
Approx. ground level

Agricultural cropland: Land used for grazing, farming, livestock, dairying, pasturage, cultivation, or animal husbandry. Unused, wooded, floodable, or other marginal areas.
Approx. ground level